



ABOVE & BEYOND

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BRAINS AND BRAWN: RUGGED NEW LAND ROVER DEFENDER SHOWCASES WORLD-FIRST DUAL eSIM CONNECTIVITY AT CES 2020

- **2020 Land Rover Defender features world-first dual-modem, dual eSIM design for enhanced connectivity and functionality. Powered by two Qualcomm® Snapdragon™ 820Am Automotive Platforms, each with an integrated Snapdragon X12 modem**
- **With two LTE modems, the New Defender can download Software-Over-The-Air (SOTA) updates without interruption and while streaming music and apps through the vehicle's new Pivi Pro infotainment system¹**
- **The New Defender features 16 electronic modules that can be updated remotely, and uses cloud-based technology from CloudCar to provide personalization, content and services¹**
- **Comprehensive range of Advanced Driver Assistance Systems developed with Bosch including a 3D Surround Camera system³**
- **The New Defender 110 and 90 will be featured at CES 2020, January 7-10, in the Qualcomm (LVCC, North Hall, 5606) and BlackBerry (LVCC, North Hall 7515) booths**

(LAS VEGAS) – January 6, 2020 – The Land Rover Defender family will showcase its new dual eSIM connectivity at CES 2020 in Las Vegas, the world's largest consumer electronics show, January 7-10.

The 2020 Land Rover Defender is the first vehicle with two embedded LTE modems for enhanced connectivity, while the vehicle's new Pivi Pro infotainment system shares electronic hardware with the latest smartphones.

The fast and intuitive Pivi Pro system allows customers to make full use of the Software-Over-The-Air (SOTA) technology in the New Defender without compromising the system's ability to stream music and connect to apps¹. With its own designated LTE modem and eSIM, the SOTA technology can operate in the background without affecting the day-to-day connectivity provided by the separate modem and eSIM in the infotainment module.

The always-on, connected Pivi Pro setup sits at the heart of the cabin in the New Defender. A 10-inch high-resolution touchscreen allows customers to control numerous aspects of the vehicle using the same processing hardware as the latest smartphones. In addition, customers can connect two mobile devices at once using Bluetooth².

"With one LTE modem and eSIM dedicated to the Software-Over-The-Air (SOTA) technology and the same set-up looking after music streaming and apps, New Defender has the digital capacity to keep customers connected, updated and entertained at all times anywhere in the world," said Peter Virk, Director of Connected Car and Future Technology, Jaguar Land Rover. "You could liken the design to a brain, with each half enjoying its own connection for unrivalled and uninterrupted service. Like the brain, one side of the system looks after logical functions, like SOTA, while the other takes care of more creative tasks."

Pivi Pro is equipped with its own battery, so the system is always on and able to respond immediately on startup. As a result, the navigation is ready to accept new destinations the moment the driver sits in the vehicle². The system allows customers to access to the latest software updates remotely – including navigation mapping data – without the need to visit retailers for updates to be installed.

The LTE connectivity behind the Jaguar Land Rover infotainment system also allows the New Defender to roam across multiple networks in different regions to help optimize connectivity. In

addition, the cloud-based architecture provided by CloudCar is designed to make it easy to access and use content and services¹.

Land Rover has also confirmed the first New Defender SUVs will feature more SOTA capability than originally projected. At its Frankfurt Motor Show launch in September 2019, Land Rover announced that 14 individual electronic control modules would be able to receive remote updates, however, the first production vehicles will feature 16 control units capable of receiving SOTA updates. Land Rover engineers estimate that in-dealer software updates will be a thing of the past for Defender customers before the end of 2021 as additional SOTA modules come online, rising from the current 16 to more than 45.

Land Rover will showcase its advanced Pivi Pro technology at the Consumer Electronics Show (CES) in Las Vegas, with the New Defender 110 and 90 taking pride of place on the Qualcomm (LVCC, North Hall, 5606) and BlackBerry (LVCC, North Hall 7515) stands respectively.

Qualcomm Technologies

Powering the Defender's Pivi Pro infotainment and Vehicle Domain Controller are two high-performance Qualcomm® Snapdragon™ 820Am Automotive Platforms, each with an integrated Snapdragon® X12 LTE modem. The Snapdragon 820Am Automotive Platform delivers unprecedented performance and technology integration designed to support highly advanced telematics, infotainment and digital clusters. It delivers rich, immersive and seamless connected in-vehicle experiences, while making next-generation vehicles more connected, smart and contextually aware.

With its power-efficient CPU cores, stunning and state-of-the-art GPU performance, integrated machine learning and powerful video processing capabilities, the Snapdragon 820Am Automotive Platform is designed to provide unmatched connected in-car experiences, including responsive interfaces, immersive 4K graphics, high-definition media streaming, and immersive audio.

Two X12 LTE modems provide parallel high-bandwidth downlink and uplink connectivity across multiple networks, ultra-fast connectivity and lower latency for secure, reliable communications. Additionally, the X12 LTE modem features an integrated global navigation satellite system (GNSS) and automotive dead reckoning, increasing the vehicle's capability to accurately keep track of its location and position.

BlackBerry QNX

The New Defender is the first Land Rover vehicle to include a domain controller that consolidates a number of Advanced Driver Assistance Systems (ADAS) and driver convenience functions built on top of the QNX Hypervisor. Consolidating more systems onto fewer ECUs is integral to the future of automotive electrical design and will be the model for the Land Rover brand's next-generation vehicle architecture.

Within the New Defender, the BlackBerry QNX operating system helps deliver a smartphone-like experience for Pivi Pro infotainment users. The technology also powers the operating system for the latest generation TFT Interactive Driver Display, which can be configured to show vehicle instrumentation, navigation instructions and mapping information or a combination of the two².

Certified to the highest level of ISO 26262 – ASIL D, the QNX operating system provides the ultimate peace of mind to Defender drivers. The first ASIL D-certified QNX Hypervisor for Safety ensures the multiple Operating Systems (OS) powering the safety-critical factors (e.g. body domain control) are isolated from non-safety critical systems (e.g. infotainment). This is critical to ensuring that compromised systems, or those requiring updates, won't impact driving functions.

As a leader in safety-certified, secure and reliable embedded software, BlackBerry QNX technology is embedded in more than 150 million vehicles on the road today and used by top automakers for their ADAS, digital instrument clusters, connectivity modules, hands-free, and infotainment systems.

CloudCar

Jaguar Land Rover is the first global car maker to use CloudCar's latest cloud-based services platform. Working with the world-leading developer of connected driver experiences brings new levels of customer convenience to the Pivi Pro infotainment fitted to the New Defender.

By scanning with smartphone QR codes displayed on Pivi Pro, user accounts are compatible with music streaming services including Spotify, TuneIn and Deezer that are automatically recognized and added to the cloud – transferring the driver's digital life to their vehicle in a heartbeat. From this point, customers can access and stream content without even having their smartphone in the vehicle. Content provider updates are carried out in the cloud, so they are always up to date – even if the corresponding smartphone app has not been updated¹.

The CloudCar system supports a variety of service and content functionalities and recognizes dial-in numbers and codes, as well as locations, stored within calendar meeting invites. Customers can then navigate to or dial-in to meetings and conference calls with a single touch of the central touchscreen².

The 2020 Land Rover Defender is the first vehicle to make use of the latest-generation technology, marking the next step in Jaguar Land Rover's ongoing partnership with CloudCar, which dates back to 2017.

Bosch

Land Rover is on the road to a connected and autonomous future and the New Defender features a variety of technologies developed with Bosch to enhance the driving experience.

Alongside the latest Advanced Driver Assistance Systems (ADAS), which include Adaptive Cruise Control and Blind Spot Assist³, Bosch has supported the development of the Land Rover brand's innovative 3D Surround Camera System³, which gives drivers a unique view of the vehicle's immediate perimeter using four wide-angle HD cameras, each providing a 190-degree field-of-view.

Connected using a 3Gbit/s video backbone and fused with 14 ultrasonic sensors, the clever technology gives drivers a choice of vantage points including a top-down plan view and seamless perspective view. It even performs as a virtual scout, allowing customers to pan around the vehicle on screen for the ultimate Command Driving Position on and off-road³.

Land Rover and Bosch have a relationship that stretches back decades and has pioneered numerous propulsion and motion control features that will go on to become the industry standard, including ClearSight Ground View³, Land Rover Wade Sensing technology⁴ and Advanced Tow Assist features⁵ – all are enabled by the Bosch driver assistance platform.

For more information about the New Land Rover Defender, visit www.landroverusa.com.

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¹ Certain Pivi Pro features require an appropriate SIM card and a data plan with separate terms and conditions and may require an additional subscription after an initial term. Mobile connectivity cannot be guaranteed in all locations. Do not use such features under conditions that will affect your safety or the safety of others. Driving while distracted can result in loss of vehicle control.

² Driving while distracted can result in loss of vehicle control. Do not operate, adjust or view the navigation or multimedia systems under conditions that will affect your safety or the safety of others. Only use mobile phones, and other devices, even with voice commands, when it is safe to do so

³ These systems are not a substitute for driving safely with due care and attention and will not function under all circumstances, speeds, weather and road conditions, etc. Driver should not assume that these systems will correct errors of judgment in driving. Please consult the owner's manual or your local authorized Land Rover Retailer for more details.

⁴ Driving in floodwaters or moving water should be avoided. Driving through water can be extremely dangerous. The Wade Sensing feature only detects depth of water the vehicle is in at the present time and not of water ahead or around the vehicle. Therefore, Wade Sensing cannot predict whether it is safe to proceed and cannot detect steep drops in grade around the vehicle. The driver is responsible for determining the conditions of the route being driven

⁵ Before towing, please consult the owner's manual or your local authorized Land Rover Retailer for more details

Contact:**Joe Stauble**

PR & Communications Manager, Land Rover
Jaguar Land Rover North America, LLC
(201) 264-5991
jstauble@jaguarlandrover.com

Stefanie Wellings

Senior PR Specialist, Land Rover
Jaguar Land Rover North America, LLC
(201) 818-8025
swellin1@jaguarlandrover.com

Note to Editors:

Information about Land Rover North America products is available to consumers at www.landroverusa.com. Visit www.us.media.landrover.com for news releases, high-resolution photographs and broadcast quality video footage. Additional media updates are available on Facebook (LandRoverUSA) and Twitter (@interactivelr).

About Land Rover

Founded in 1948, Land Rover designs, engineers, and manufactures its vehicles in the United Kingdom. For almost 70 years the brand has built a reputation for providing its clientele with some of the most luxurious and capable vehicles in the world; whether driving through the heart of the city or traversing the countryside on- and off-road. Today's Land Rover lineup includes the Defender; Discovery and Discovery Sport; Range Rover, Range Rover Sport, Range Rover Velar, Range Rover Evoque. Land Rover is fully engaged with sustainability initiatives and social concerns with continuous involvement in environmental and community programs. For more information, visit the official Land Rover website at www.landroverusa.com.

About Jaguar Land Rover

Jaguar Land Rover is the UK's largest automotive manufacturer, built around two iconic British car brands: Land Rover, the world's leading manufacturer of premium all-wheel-drive vehicles; and Jaguar, one of the world's premier luxury sports sedan and sports car marques.

At Jaguar Land Rover, we are driven by a desire to deliver class-leading vehicles, which will provide experiences our customers will love, for life. Our products are in demand around the globe. In 2018 Jaguar Land Rover sold 592,708 vehicles in 128 countries.

We support around 260,000 people through our retailer network, suppliers and local businesses. At heart we are a British company, with two major design and engineering sites, three vehicle manufacturing facilities and an engine manufacturing center in the UK. We also have plants in China, Brazil, India, Austria and Slovakia.

From 2020 all new Jaguar Land Rover vehicles will offer the option of electrification, giving our customers even more choice. We will introduce a portfolio of electrified products across our model range, embracing fully electric, plug-in hybrid and mild hybrid vehicles as well as continuing to offer the latest diesel and gasoline engines.